

Two New Species of *Acanthoscelides* from North America and New Host Records from *Desmanthus* and *Hoffmanseggia*

(Coleoptera: Bruchidae)

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In recent years considerable interest has been shown in the systematics, ecology, behavior, host plants, and evolution of non-economic species of Bruchidae. For example, Janzen (1969, 1971a, 1971b, 1975, 1976), Center and Johnson (1973, 1974, 1976), Whitehead and Kingsolver (1975a, 1975b), Pfaffenberger and Johnson (1976), and Johnson and Kingsolver (1973, 1976) represent some of the research that has been published on these aspects of the Bruchidae. Because names for new species are needed for research in progress on the Bruchidae, two new *Acanthoscelides* are described here and their known host plants are given.

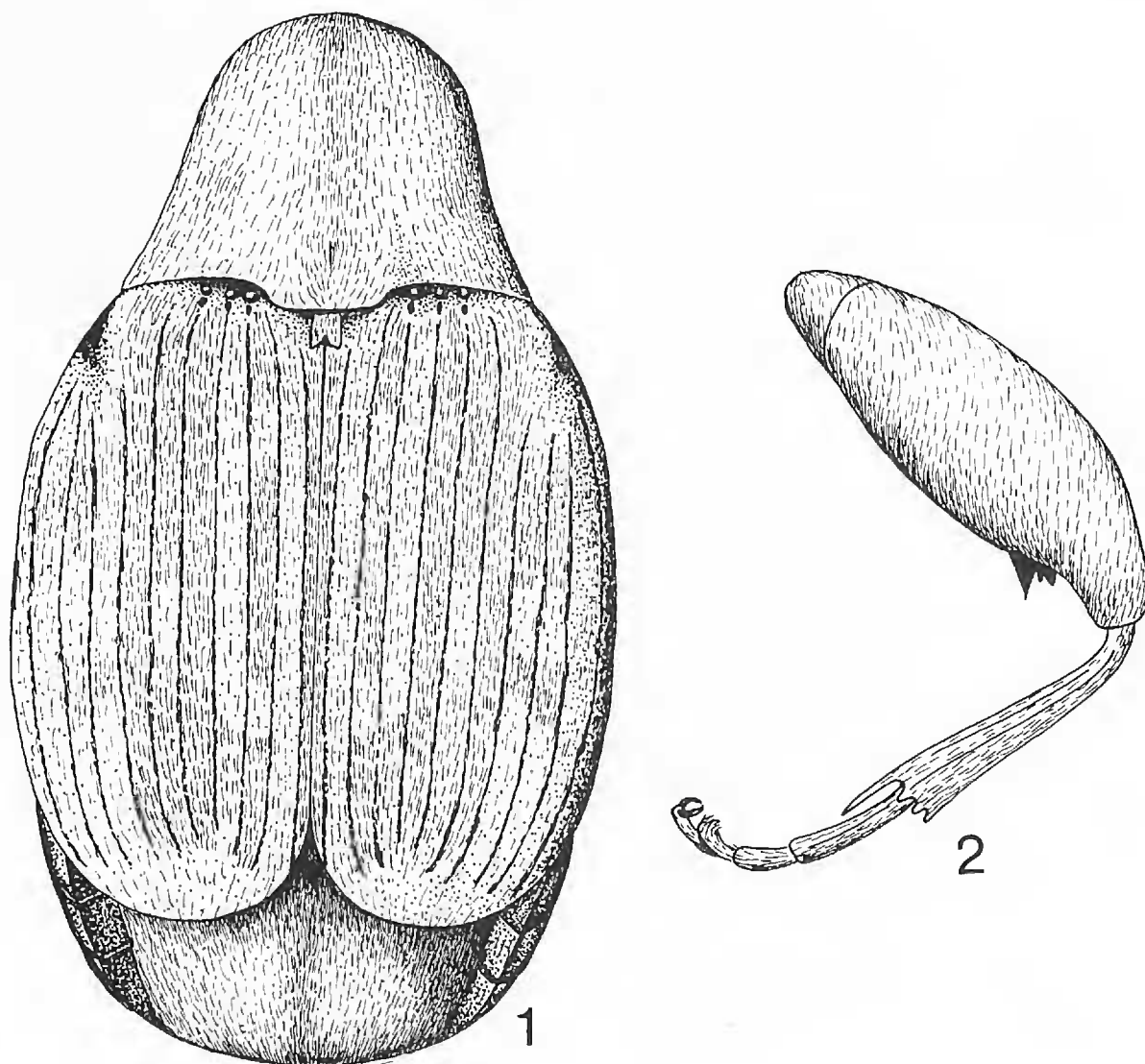
Since Johnson and Kingsolver's 1976 treatment of *Stator* was completed and especially since Johnson's 1970 revision of *Acanthoscelides* was published, much new host data have become available. These data are given here to supplement host data given in the above works and host locality data are published as a reference for ongoing research. For ease of reference the host information is cross-referenced in two tables.

The methods of Johnson (1970) for collecting and rearing were used. In this paper C. D. Johnson is abbreviated CDJ and L. J. Bottimer is abbreviated LJB.

Acknowledgments

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Figs. 1-2, *Acanthoscelides derifieldi*: 1. habitus; 2. hind leg.

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***Acanthoscelides derifieldi*, new species**

(Figs. 1-4)

Length (pronotum-elytra) 1.5-2.3mm. Width 1.0-1.5mm. Maximum thoracic depth 0.8-1.2mm.

MALE: *Integument Color* — Head black; basal four to five antennal segments red orange, remainder dark brown to black. Prothorax, elytra, pygidium and undersurfaces dark brown to black. Pro- and mesothoracic legs red orange except about basal 0.1 of femora dark brown; metathoracic legs red orange except basal 0.5 of femur dark brown to black. *Vestiture* — With recumbent white, golden and brown hairs as follows: eye with medial fringe of white hairs; postocular lobe with short white hairs; dense postocular patch of white hairs; remainder of head with white hairs, hairs becoming brownish at base of head; pronotum with brown hairs interrupted by a narrow white stripe on midline, a small white

patch on either side lateral to stripe, and basal white patches (fig. 1); undersurface of prothorax with white hairs; pattern of elytral vestiture variable with patches of brown and white hairs, sometimes brown predominating, sometimes white; basic pattern of elytron is usually irregular bands of brown hairs near base, middle, and apex (fig. 1); pygidium with moderately dense white hairs, becoming more dense at base near middle, usually forming a line of dense white hairs on midline; line flanked on either side by two irregular patches of brown hairs; undersurfaces and legs covered with uniform, moderately dense to dense white hairs. *Head* — Short, densely punctulate; frons without line or carina extending from frontoclypeal suture to vertex; vague transverse sulcus between upper limits of eyes; width of eye about equal to width of frons; ocular sinus about 0.66 as long as width of eye; posterior margin of eye protruding from adjacent surfaces; postocular lobe rounded, not angulate; distance from base of antennae to apex of labrum about 0.5 as long as distance from upper limits of eyes to apex of labrum; antennal segments 1 and 3 usually filiform, 2 and 4 usually moniliform; 5 to 10 eccentric, 11th subacute apically; 5 to 11 slightly broader than long; antenna reaching to slightly beyond humerus. *Prothorax* — Disk subcampanulate (fig. 1), with many punctations; cervical sulcus well-marked, extending from near coxal cavity to about 0.5 distance to pronotal midline; lateral prothoracic carina vague, present only near base; short median impressed line on median basal lobe usually obscured by pubescence; prosternum separating procoxae for about 0.7 their length. *Mesothorax and Metathorax* — Scutellum small, slightly longer than broad, with lateral posterior teeth, clothed with dense recumbent white hairs; elytron about twice as long as broad; striae deep, punctate, strial intervals rugulose; distance between striae at base subequal (fig. 1), often 5 and 6 closer to one another at base than to adjacent striae; small pits preceded by a small spine at bases of striae 3,4,5; humerus rugulose, usually glabrous; undersurfaces punctate; all of hind coxa punctate; hind femur constricted basally and apically, expanded medially to 1.3 to 1.5 times more than width of coxa (fig. 2); inner ventral surface with vague longitudinal carina; femur armed with an inner subapical acuminate spine about 1.2 as long as width of tibial base, and 2 or 3 smaller spines 0.33 to 0.5 as long as 1st spine; tibia with ventral, lateroventral, lateral and dorsomesal glabrous longitudinal carinae; dorsal surface without fossa; tibial corona with 3 to 4 spinules, mucro about 0.45 as long as 1st tarsomere; sinus at base of mucro; 1st tarsomere with ventral, lateral and mesal glabrous longitudinal carinae. *Abdomen* — Sterna not flattened medially; 1st sternum with small tuft of dense white hairs on midline near base, sternum about 0.33 as long as abdomen, posterior margin straight; sterna 2 to 4 unmodified, 5th emarginate; pygidium punctulate, convex in lateral view. *Genitalia* — Figs. 3, 4. Median lobe elongate; in ventral view ventral valve subtriangular, lateral margins arcuate, base about 0.75 as wide as apex of median lobe, with a sharp ridge along midline, arcuate in lateral view; without hinge sclerites; armature of internal sac consisting of 3 large, rounded spines, one slender spine, and 2, paired, elongate spines near middle; dense mass of spicules near apex, sometimes spicules associated with dense, slender, sclerotized rods. Lateral lobes slender, elongate, expanded apically, cleft to about 0.8 their length (fig. 4).

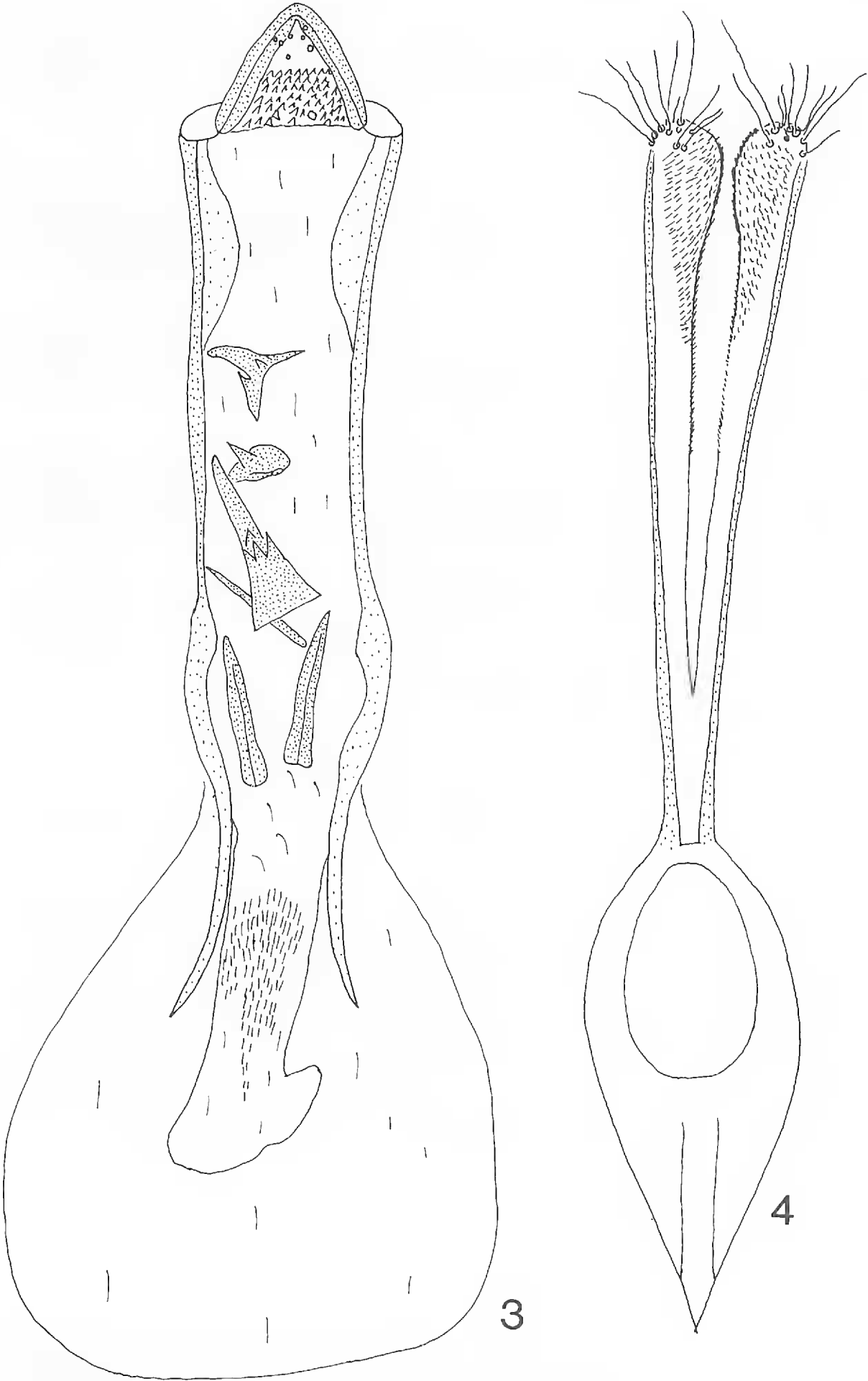
FEMALE: Similar to male except antenna shorter reaching only to humerus; apex of last abdominal sternum convex, about as long as 2 preceding sterna.

HOST PLANTS: *Desmanthus* spp.: Mexico. Sonora: Benjamin Hill, 21 December 1972 (CDJ #134-72) and 31 December 1975 (CDJ #159-75); 8 mi N El Oasis, 31 August 1965 (CDJ); 15 mi S Oroz, 28 January 1964 (P. M. Estes).

Desmanthus covillei (Britt. & Rose) Wiggins ex Turner: Mexico. Sonora: 8 mi E Navojoa, 24 February 1973 (CDJ #175-73); 9 mi E Navojoa, 30 December 1975 (CDJ #152-75).

D. subulatus (Britton & Rose) Wiggins ex Turner: Mexico. Baja California Sur: 9 mi S Villa Constitucion, 25 December 1975 (CDJ #103-75).

TYPE SERIES: Holotype ♂ allotype ♀ and several paratypes: Mexico. Sonora: 9 mi E Navojoa, 30 December 1975, reared seeds *Desmanthus covillei*, C. D. Johnson collector, #152-75. USNM #72783. Additional paratypes listed under HOST PLANTS. Other specimen (not a paratype): Mexico. Sonora: 42 mi N Guaymas, 30 August 1965 (C. D. Johnson). Holotype, allotype and several paratypes deposited in the U. S. National Museum of Natural



Figs. 3-4, *Acanthoscelides derifieldi* male genitalia: 3. median lobe; 4. lateral lobes.

History, Washington, D.C. Paratypes retained in the author's collection and also deposited in the following collections: Arizona State University, Tempe; California Academy of Sciences, San Francisco; Canadian National Collection of Insects, Ottawa; Museum of Comparative Zoology, Harvard University, Cambridge, Mass.; and the University of Arizona, Tucson.

Acanthoscelides derifieldi is a rare species which superficially resembles *A. pullus* (Fall) and *A. pauperculus* (LeConte) in the color pattern of the dorsal surfaces. It differs from *A. pullus* in having a longer tibial spine, a wider, stronger hind femur, and a shorter scutellum.

It is more closely related to *A. pauperculus* and its relatives but differs from them by having a slightly elongate scutellum and lateral tibial carinae. *A. derifieldi* differs significantly from both *A. pullus* and *A. pauperculus* and their relatives in the structure of the male genitalia and in having very different host preferences.

The *A. longistilus* - *A. biustulus* group is most similar in overall structure to *A. derifieldi*, especially the hind leg. The elytral vestiture pattern, the male genitalia, and, of course, host plants are quite different between *A. derifieldi* and this group.

A. derifieldi is apparently confined to hosts in the genus *Desmanthus* and is not too successful in them.

This species is named for Professor Ken Derifield, Northern Arizona University, master teacher of biologists.

***Acanthoscelides desmanthi*, new species**

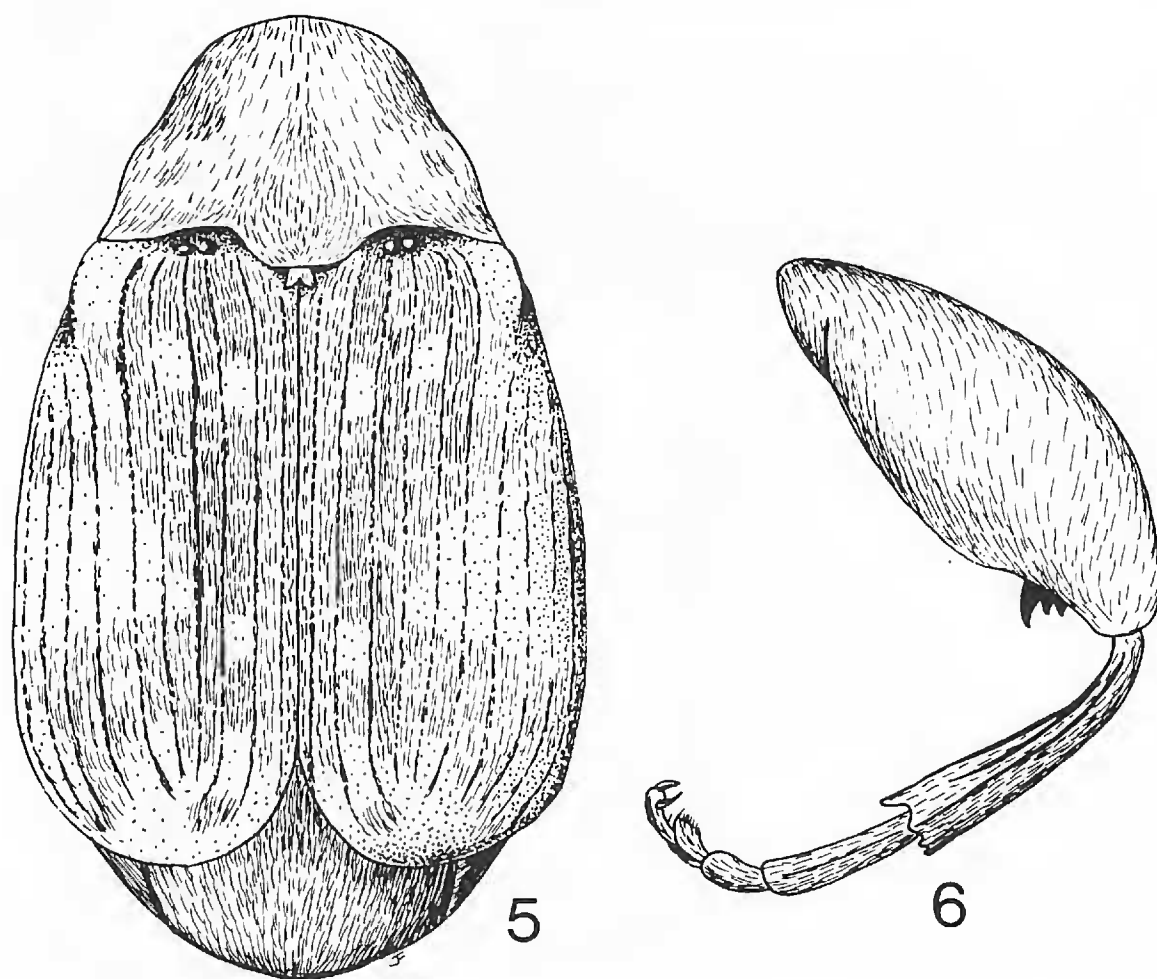
(Figs. 5-10)

Length (pronotum-elytra) 1.5-2.1mm. Width 0.9-1.2mm. Maximum thoracic depth 0.8-1.0mm.

MALE: Similar to *Acanthoscelides bisignatus* (Horn) (see Johnson 1970, p. 37) with the following exceptions: Head usually red-orange with frons and vertex black; vestiture of pronotum and elytra (fig. 5) usually more contrasting and dense than *A. bisignatus*. **Genitalia** — Figs. 7, 8. Median lobe moderately long; in ventral view, ventral valve subtriangular, lateral margins slightly concave, base about as wide as apex of median lobe; ventral valve arcuate in lateral view and perpendicular to long axis of median lobe; armature of internal sac consisting of about basal one-half lined with fine spicules, a medial clump consisting of two bands of strong spines connected to elongate strands of moderately strong spines extending toward apex; apex with about eight scattered strong, rounded spines. Lateral lobes expanded apically, cleft to about 0.9 their length (fig. 4).

FEMALE: No differences.

HOST PLANTS: *Desmanthus* spp.: Texas. Nueces Co.: Robstown, 4 July 1922 (LJB #49y6). Cameron Co.: Harlingen, 28 July 1922 (LJB #50h1); Brownsville, 8 January 1923 (LJB #51g2). Mexico. Sonora: 15 mi S Oroz, 28 January 1964 (P. M. Estes); 42 mi N Guaymas, 30 August 1965 (CDJ); Benjamin Hill, 21 December 1972 (CDJ #134-72); 13 mi E Navojoa, 25 December 1972 (CDJ #169-72); Benjamin Hill, 31 December 1975 (CDJ #159-75); 8 mi E Navojoa, 25 December 1972 (CDJ #174-72); 35 mi. SE Guaymas, 8 January 1973 (CDJ #140-73); 5 mi N Guaymas, 31 December 1975 (CDJ #155-75). Sinaloa: 19 mi N Mazatlan, 7 January 1973 (CDJ #124-73); 4 mi S Culiacan, 26 December 1972 (CDJ #182-72); 53 mi S Culiacan, 26 December 1972 (CDJ #187-72); 3 mi S Rosario, 27 February 1973 (CDJ #224-73); 14 mi S Culiacan, 7 January 1973 (CDJ #133-73); 4 mi S Culiacan, 25 February 1973 (CDJ #187-73); 26 mi S Culiacan, 25 February 1973 (CDJ #192-73). Jalisco:



Figs. 5-6, *Acanthoscelides desmanthi*: 5. habitus; 6. hind leg.

ca 4000', 15 mi W Magdalena, 2 March 1973 (CDJ #317-73). Nuevo Leon: 2 mi SE Salinas Victoria, 19 & 20 June 1964 (CDJ). Tamaulipas: 7 mi. E Ciudad Mante, 21 June 1964 (CDJ).

Desmanthus covillei (Britt. & Rose) Wiggins ex Turner: Mexico. Sonora: San Carlos Bay, 23 December 1972 (CDJ #144-72); 8 mi E Navojoa, 24 February 1973 (CDJ #175-73); 9 mi E Navojoa, 30 December 1975 (CDJ #152-75); 14 mi S Navojoa, 24 February 1973 (CDJ #180-73).

D. virgatus (L.) Willdenow: Texas. Lasalle Co.: Encinal, 4 July 1947 (LJB #88a). Mexico. Oaxaca: 6 mi E Tehuantepec, 6 July 1968 (CDJ #219-68); 2800', 53 mi NW Tehuantepec, 6 July 1968 (CDJ #224-68); 27 mi S Matias Romero, 16 June 1968 (CDJ #128-68). Chiapas: 3-5 mi W Ocozocoautla, 17 June 1968 (CDJ #142-68).

D. virgatus var. *depressus*: Texas. Cameron Co.: Brownsville, 21 September 1947 (LJB #89g).

TYPE SERIES: Holotype ♂, allotype ♀ and one paratype: Mexico. Chiapas: 3-5 mi W Ocozocoautla, 17 June 1968, reared seeds *Desmanthus virgatus*, C. D. Johnson #142-68. USNM #72782. Numerous additional paratypes listed under HOST PLANTS. Other specimens (not paratypes): Texas. Cameron Co.: Brownsville, 8 July 1941 (B. E. White); Hidalgo Co.: 20 March 1952 (D. J. & J. N. Knull). Mexico. Veracruz: 29 mi SE Jalapa, 900', 26 December 1963 (C.W. O'Brien). Guanajuato: 11 mi SW Irapuato, 6000', 21 December 1963 (C. W. & L. B. O'Brien). Sinaloa: 18 mi S. Villa Union, 31 January 1964 (P. M. Estes), 8 mi S Escuinapa, 18 December 1963 (L. B. & C. W. O'Brien). Holotype, allotype, and numerous paratypes deposited in the U. S. National Museum of Natural History, Washington, D.C. Paratypes retained in the author's collection and also deposited in the following collections: Arizona State University, Tempe; California Academy of Sciences, San Francisco; Canadian National Collection of Insects, Ottawa; Museum of Comparative Zoology,

Harvard University, Cambridge, Mass.; Texas A & M University, College Station; University of Arizona, Tucson; and the University of California, Riverside.

Acanthoscelides desmanthi is only separated consistently from *A. bisignatus* by examining the male genitalia. *A. desmanthi* has many strong spines in the internal sac (fig. 7) and its lateral lobes are cleft to about 0.9 their length (fig. 8) while the genitalia of *bisignatus* have a few moderately strong spines and the lateral lobes are cleft only for about 0.5 their length.

Externally there are no consistent features to separate these two species. Usually the head of *bisignatus* is mostly black and the head of *desmanthi* is mostly red-orange with a dark vertex and frons. The pronotal and elytral vestiture of *desmanthi* is similar in pattern to that of *bisignatus* but is usually brighter and more dense.

A. bisignatus occurs only in the United States, east of the Continental Divide and north of about 30° N latitude in Texas. This distribution generally conforms to that of *Desmanthus illinoensis*, probably its most common host. The distributions of *D. illinoensis*, *D. leptolobus*, and *D. velutinus*, its known hosts in Texas (Turner, 1959), generally match the known distribution of *A. bisignatus* in Texas. It has been collected as far west as Albuquerque, New Mexico, and as far east as Florida. I have examined the lectotype of *bisignatus* and, although it is a female, it is a member of the northern population and is a true *bisignatus*.

A. bisignatus was reported by Cushman (1911) as being reared from *D. virgatus*. Cushman almost certainly reared *A. desmanthi* from this plant because the only verified records of rearing *desmanthi* have been from *D. virgatus* and *D. covillei* while no verified rearings of *bisignatus* have been reported.

These 2 species are easily separated from other *Acanthoscelides* by the size and shape of the spines on the hind leg (fig. 6) and the sexual dimorphism of the heads of the males and females (figs. 9, 10).

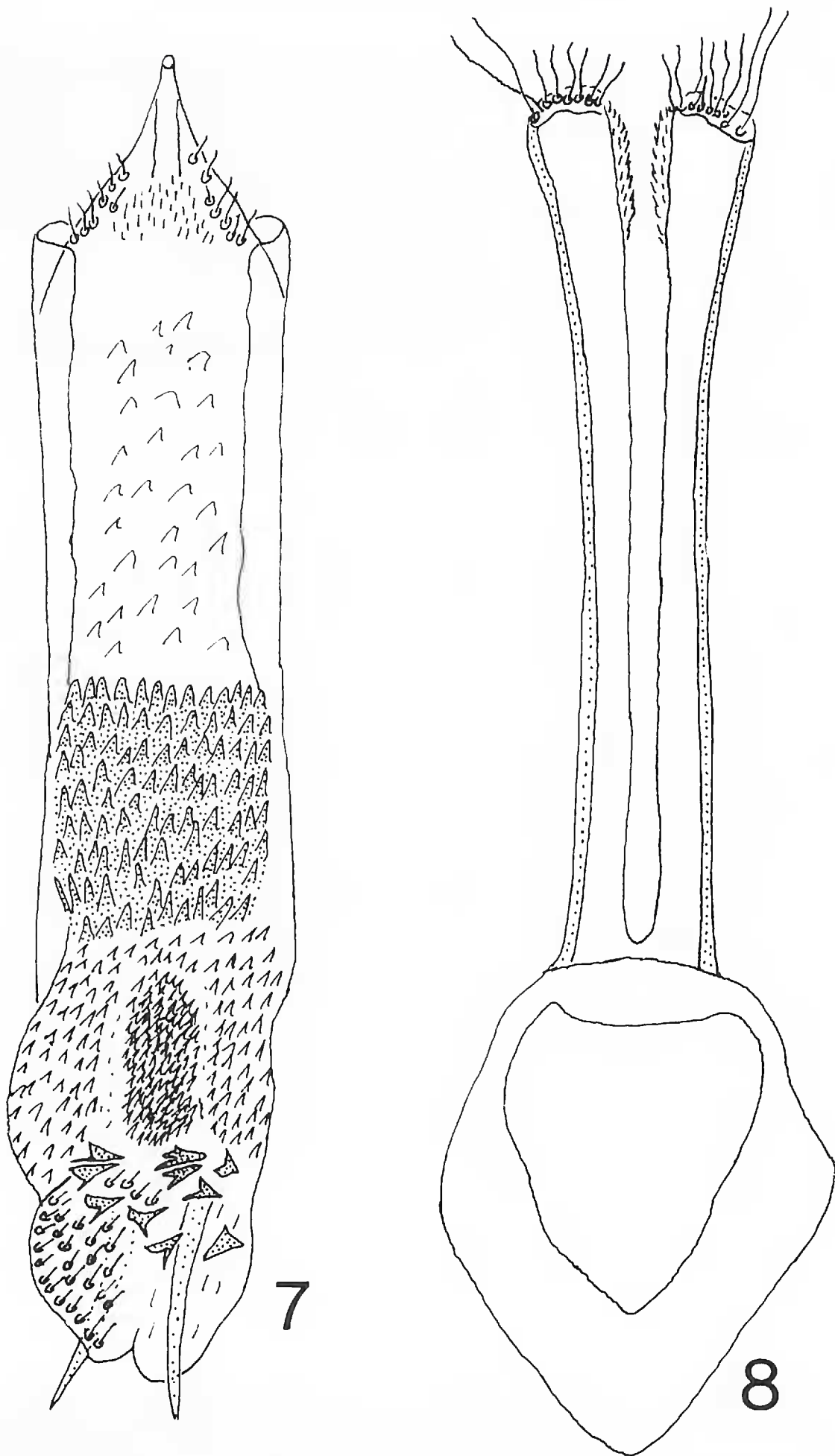
Apparently *desmanthi* and *bisignatus* are primarily allopatric with perhaps a zone of sympatry in central and possibly southern Texas but there is no evidence of hybridization. One explanation for the lack of hybridization is that they are very host specific.

The distribution of *desmanthi* is from southern Texas and northern Sonora to Chiapas, Mexico. This distribution generally matches that of *Desmanthus virgatus*, probably its most common host. *D. virgatus* has a wide distribution in the tropics and *desmanthi* most likely will be found to be associated with it more extensively with further collections.

New Host and Locality Records for Bruchids Infesting

Desmanthus and *Hoffmanseggia*

The mimosoid legume genus *Desmanthus* contains about 40



Figs. 7-8, *Acanthoscelides desmanthi* male genitalia: 7. median lobe; 8. lateral lobes.

species distributed in the warmer regions of North and South America, but a few taxa of the *Desmanthus virgatus* complex are pan-tropical (Turner, 1959). Mexico has about 20 of the world's recognized taxa (Turner, 1959). When compared with the few species infested by bruchids in other plant genera, it is surprising that about one-half of these species are known to have their seeds fed upon by bruchids (Tables 1, 2). Probably this is because few bruchid host genera have had their seeds systematically examined for bruchids.

Six species of bruchids infest species of *Desmanthus*, which is also remarkable considering the relatively small number of species in this plant genus. Of the 6 species, only *bisignatus* and *desmanthi* appear to be closely related. The other 3 species of *Acanthoscelides* are not particularly close in their morphology and the opportunistic species *Stator pruininus* is very remotely related to the species of *Acanthoscelides*.

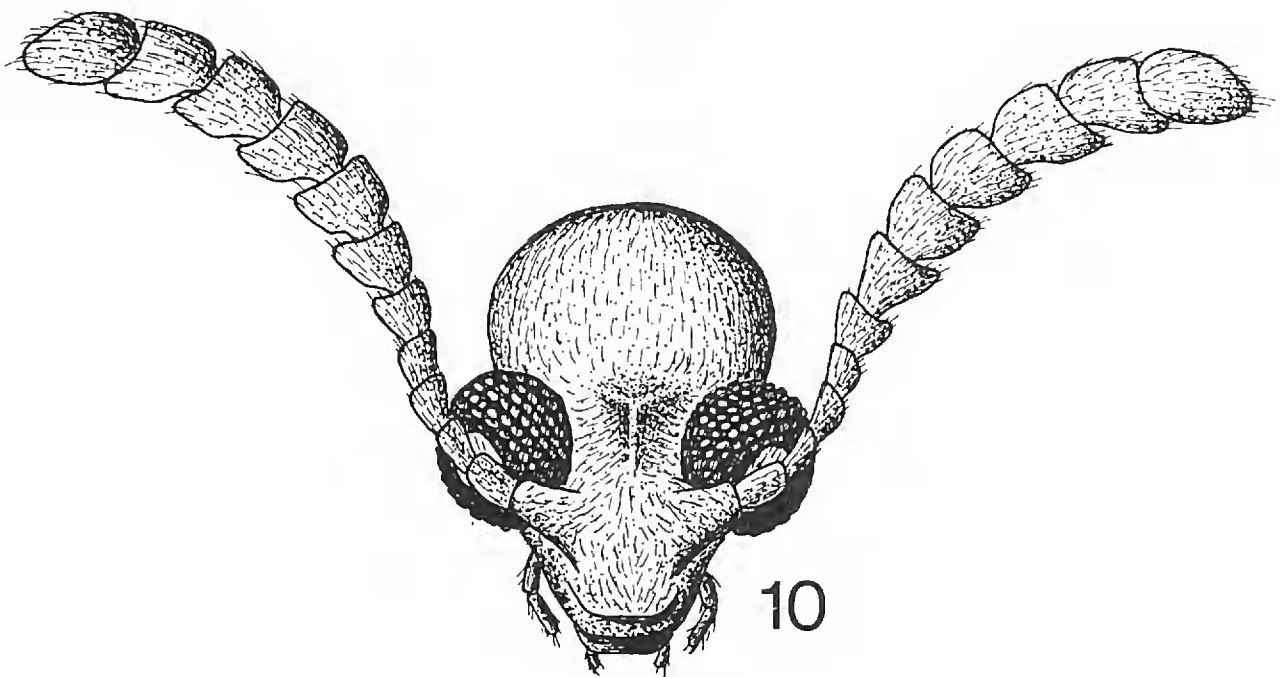
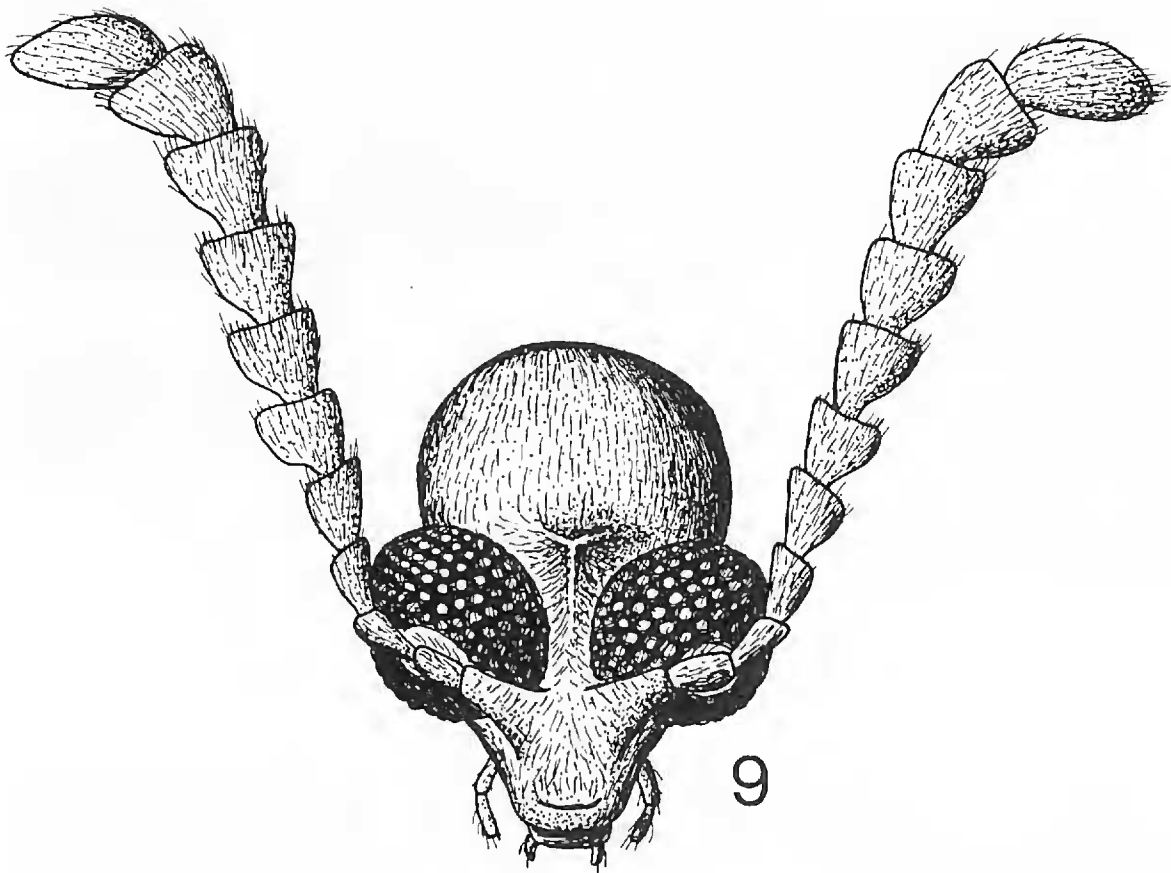
The caesalpinoid legume genus *Hoffmanseggia* contains about 30 species, mostly in dry areas of subtropical North America, South America, and South Africa (Turner, 1959). The only bruchid known to infest its seeds (Table 2) is the apparently opportunistic species *Acanthoscelides compressicornis*. It is not unusual for a bruchid to have a wide variety of hosts, but it is unusual for a bruchid with many host species to be found only in 2 genera and these genera in different subfamilies! Further studies will further elucidate the evolutionary role played by this bruchid, not only its relationships to other bruchids, but its role in the evolution of its plant hosts.

No host records have been reported in the literature for *A. pectoralis* so the 3 hosts listed below for this species are new. Ten new hosts are reported for *A. compressicornis* and 3 new records for *S. pruininus* for total of 16 for these 3 species. Because the taxonomic confusion between *A. bisignatus* and *A. desmanthi* has now been clarified, it is possible to recognize the sharp division between the host preferences of these 2 species (Tables 1, 2).

It is of interest to note here that *A. compressicornis* not only has a wide range of hosts but also has a wide geographical range. *A. desmanthi* has a wide geographical range but far fewer hosts. These phenomena are common in the species of Bruchidae and were briefly discussed by Johnson and Kingsolver (1973). Further studies will help to explain these distributional patterns of bruchids and their hosts.

Acanthoscelides bisignatus (Horn)

1. *Desmanthus illinoensis* (Michx.) MacM.: Texas. Menard Co.: Menard, 27 April 1946 (LJB #85t), 2 October 1960 (LJB #109d) and 30 July 1946 (LJB #86x). Dallas Co.: 5 mi E Dallas 15 October 1927 (LJB #54v2). Tarrant Co.: St. Francis Village, 10 August 1968 (LJB #128p). Ellis Co.: Bristol, 30 July 1959 (LJB #105c). Oklahoma: Woodward, 25 September 1954 (LJB #94p); Tulsa, September 1958 (A.P. Blair).



Figs. 9-10, *Acanthoscelides desmanthi*: 9. head, male; 10. head, female.

2. *D. leptolobus* Torrey & Gray: Texas. Johnson Co.: 9 mi S Cleburne, 2 August 1959 (LJB #105e).
3. *D. leptolobus?*: Texas. Hale Co.: Plainview, 28 December 1923 (LJB #52k8). Lubbock Co.: Lubbock, 21 December 1923 (LJB #52k4).
4. *D. velutinus* Scheele: Kerr Co.: Kerrville, 18 June 1947 (LJB #87x).

Acanthoscelides compressicornis (Schaeffer)

1. *Desmanthus* spp.: Texas. Kerr Co.: Kerrville, 8 June 1955 (LJB #94u). Kansas: Eskridge, 29 August 1947 (LJB #88q). Mexico. Sonora: Benjamin Hill, 21 December 1972 (CDJ #134-72); 35 mi SE Guaymas, 8 January 1973 (CDJ #140-73); 6 mi S Santa Ana, 8 January 1973 (CDJ #142-73); 5 mi N Guaymas, 31 December 1975 (CDJ #155-75); Benjamin Hill, 31 December 1975 (CDJ #159-75).
2. *Desmanthus cooleyi* (Eaton) Trel.: Arizona. Yavapai Co.: 4 mi SE Camp Verde, 10 September 1972 (CDJ #59-72). Coconino Co.: base, south slope, Mt. Elden, Flagstaff, 21 September 1972 (CDJ #69-72); 7.6 mi W Stoneman Lake, 24 August 1970 (T. D. Center); 4 mi W Stoneman Lake, 19 September 1970 (T. D. Center); 4 mi NW Flagstaff, 26 August 1970 (T. D. Center).
3. *Desmanthus covillei*: Mexico. Sonora: San Carlos Bay, 23 December 1972 (CDJ #144-72); 16 mi S Hermosillo, 21 August 1970 (CDJ #136-70).

Table 1. Bruchid species infesting *Desmanthus* and *Hoffmanseggia* (Supplement to Johnson, 1970, and Johnson and Kingsolver, 1976).

Bruchid	<i>Desmanthus</i> and <i>Hoffmanseggia</i> host species
(1) <i>Acanthoscelides bisignatus</i>	<i>D. illinoensis</i> <i>D. leptolobus</i> <i>D. velutinus</i>
(2) <i>A. compressicornis</i>	<i>D. cooleyi</i> <i>D. covillei</i> <i>D. depressus</i> <i>D. illinoensis</i> <i>D. leptolobus</i> <i>D. obtusus</i> <i>D. velutinus</i> <i>D. virgatus</i> <i>H. densiflora</i> <i>H. drepanocarpa</i> <i>H. tenella</i>
(3) <i>A. derifieldi</i>	<i>D. covillei</i> <i>D. subulatus</i>
(4) <i>A. desmanthi</i>	<i>D. covillei</i> <i>D. virgatus</i>
(5) <i>A. pectoralis</i>	<i>D. obtusus</i> <i>D. velutinus</i> <i>D. virgatus</i>
(6) <i>Stator pruininus</i>	<i>D. cooleyi</i> <i>D. covillei</i> <i>D. fruticosus</i> <i>D. subulatus</i>

4. *Desmanthus depressus* Humb. & Bonpl. ex Willdenow: Florida: Taverner, Key Largo, 9 April 1960 (LJB #106r).
5. *D. illinoensis* (Michx.) MacM.: Texas. Menard Co.: Menard, 30 July 1946 (LJB #86x). Caldwell Co.: Palmetto State Park, 30 June 1957 (LJB #101b). Tarrant Co.: St. Francis Village, 10 August 1968 (LJB #128p). Kerr Co.: Kerrville, 11 July 1950 (LJB #91z).
6. *D. leptolobus* Torrey & Gray: Texas. Johnson Co.: 9 mi S Cleburne, 2 August 1959 (LJB #105e).
7. *D. obtusus* S. Wats.: Texas. Menard Co.: Menard, 28 June 1946 (LJB #86e). Pecos Co.: 10 mi E Sheffield, 8 August 1961 (LJB #112i).
8. *D. velutinus* Scheele: Texas. Kerr Co.: Kerrville, 18 June 1947 (LJB #87x) and 19 July 1955 (LJB #95r). Johnson Co.: 9 mi S Cleburne, 2 August 1959 (LJB #105f). Kimble Co.: Junction, 17 June 1956 (LJB #97k). Lampasas Co.: 9 mi N Lampasas, 27 July 1959 (LJB #104y).
9. *D. virgatus*: Texas. Cameron Co.: Brownsville, 21 September 1947 (LJB #89g). La-salle Co.: Encinal, 4 July 1947 (LJB #88a). Kinney Co.: Spofford, 16 August 1959 (LJB #105v). Mexico. Oaxaca: 6 mi E Tehuantepec, 6 July 1968 (CDJ #219-68); 27 mi S Matias Romero, 16 June 1968 (CDJ #128-68). Chiapas: 3-5 mi W Ocozocoautla, 17 June 1968 (CDJ #142-68).

Table 2. *Desmanthus* and *Hoffmanseggia* and their infesting bruchids (Supplement to Johnson, 1970, and Johnson and Kingsolver, 1976).

(1) <i>Desmanthus cooleyi</i>	<i>Acanthoscelides compressicornis</i> <i>Stator pruininus</i>
(2) <i>D. covillei</i>	<i>A. compressicornis</i> <i>A. derifieldi</i> <i>A. desmanthi</i> <i>S. pruininus</i>
(3) <i>D. depressus</i>	<i>A. compressicornis</i>
(4) <i>D. fruticosus</i>	<i>S. pruininus</i>
(5) <i>D. illinoensis</i>	<i>A. bisignatus</i> <i>A. compressicornis</i>
(6) <i>D. leptolobus</i>	<i>A. bisignatus</i> <i>A. compressicornis</i>
(7) <i>D. obtusus</i>	<i>A. compressicornis</i> <i>A. pectoralis</i>
(8) <i>D. subulatus</i>	<i>A. derifieldi</i> <i>S. pruininus</i>
(9) <i>D. velutinus</i>	<i>A. bisignatus</i> <i>A. compressicornis</i> <i>A. pectoralis</i>
(10) <i>D. virgatus</i>	<i>A. compressicornis</i> <i>A. desmanthi</i> <i>A. pectoralis</i>
(11) <i>Hoffmanseggia densiflora</i>	<i>A. compressicornis</i>
(12) <i>H. drepanocarpa</i>	<i>A. compressicornis</i>
(13) <i>H. tenella</i>	<i>A. compressicornis</i>

10. *D. virgatus* var. *depressus*: Texas. Harris Co.: Houston, 2 July 1948 (J. L. Ward, LJB #91f3).
11. *Hoffmanseggia densiflora* Benth. ex Gray: Texas. Reeves Co.: 25 mi SE Pecos, 8 August 1961 (LJB #112h). New Mexico. Dona Ana Co.: U.S. 80 near White Sands, 7 August 1961 (LJB #112d).
12. *Hoffmanseggia drepanocarpa* Gray: Arizona. Yavapai Co.: 3.5 mi N Camp Verde, 14 & 22 June 1970 (T. D. Center); 3 mi E Drake, 6 June 1972 (CDJ #27-72). New Mexico. Luna Co.: near Deming, 24 September 1947 (O. G. Babcock).
13. *H. tenella* Tharp & Williams: Texas. Nueces Co.: Robstown, 28 July 1922 (LJB #50f3).

Acanthoscelides pectoralis (Horn)

1. *Desmanthus* spp.: Texas. Cameron Co.: Harlingen, 28 July 1922 (LJB #50h1). Kerr Co.: Kerrville, 8 June 1955 (LJB #94u). Nueces Co.: Robstown, 4 July 1922 (LJB #49y6). Mexico. Nuevo Leon: 2 mi SE Salinas Victoria, 19 & 20 June 1964 (CDJ).
2. *Desmanthus obtusus*: Texas. Menard Co.: Menard, 28 June 1946 (LJB #86e).
3. *D. velutinus*: Texas. Kerr Co.: Kerrville, 18 June 1947 (LJB #87x) and 19 July 1955 (LJB #95r). Lampasas Co.: 9 mi N Lampasas, 27 July 1959 (LJB #104y). Johnson Co.: 9 mi S Cleburne, 2 August 1959 (LJB #105f). Chalk Mt., 2 August 1959 (LJB #105g).
4. *D. virgatus*: Texas. Cameron Co.: Brownsville, 21 September 1947 (LJB #89g).

Stator pruininus (Horn)

1. *Desmanthus* spp.: Mexico. Sinaloa: 4 mi S Culiacan, 26 December 1972 (CDJ #182-72). Sonora: 5 mi N Guaymas, 31 December 1975 (CDJ #155-75); Benjamin Hill, 31 December 1975 (CDJ #159-75).
2. *Desmanthus cooleyi*: Arizona. Pima Co.: ca. 4500', mouth, Madera Canyon, 14 October 1976 (CDJ #53-76). Santa Cruz Co.: ca. 4200', 6 mi E Ruby, 15 October 1976 (CDJ #64-76).
3. *Desmanthus covillei*: Mexico. Sonora: 9 mi E Navojoa, 30 December 1975 (CDJ #152-75).
4. *D. fruticosus*: Mexico. Baja California Sur: 4 mi E Cabo San Lucas, 27 December 1975 (CDJ #125-75); 4 mi W San Jose Del Cabo, 27 December 1975 (CDJ #133-75).
5. *D. subulatus*: Mexico. Baja California Sur: 9 mi S Villa Constitucion, 25 December 1975 (CDJ #103-75).

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BOOK REVIEW

Survey of the World's Aphids. V. F. Eastop & D. Hille Ris Lambers. 1976. Dr. W. Junk b.v. P.O. Box 1713. The Hague, The Netherlands. 586 pp. Cloth. Dutch Guilders 160. —

This is an important book. Two of the world's foremost authorities on aphids have pooled their scholarship to produce a book that will make it easier to know the aphids. This book is a survey of described aphids in which the authors list all the scientific names proposed for aphids. Each species is assigned to its correct genus and subgenus according to their opinions, with which most aphid authorities in western Europe, North and South America, Australia, New Zealand, India, Taiwan, and Japan agree. First, all the genera are enumerated in alphabetical order with their type species, synonyms, and all the species originally or subsequently validly placed in them, with their synonyms. Secondly, an alphabetical list is given of all specific names, each followed by the names of the genera in which the species originally were described, of which the species was the type species, and in which they now occur.

This book should make it easier to find the correct name for an aphid, and to understand which aphid an author has in mind when he uses a scientific name. The increase in transportation speed and the partial breakdown of plant quarantines has resulted in more rapid dispersal of aphid species. For instance, we have found about one newly arrived aphid species in California each recent year. It is urgent that these newly arrived aphids be identified quickly so that search for biological control agents can be made where the aphid is indigenous.

The book is printed clearly and strongly bound to withstand the hard use that some copies will receive. I have found no errors. — R. C. DICKSON *Professor of Entomology, Emeritus, University of California, Riverside, CA 92502.*